REMARKS

In the Office Action of October 28, 2003, Claims 32, 39, 40, 42 and 43 were rejected. No claim was allowed. In response, Claims 42 and 43 are canceled without prejudice or disclaimer. Reexamination and reconsideration are respectfully requested in view of the foregoing amendments and the following remarks.

The Invention

The present invention is directed to an information recording medium that includes the feature of a first reflective layer and a second reflective layer wherein the first reflective layer is disposed closer to the recording layer than the second reflective layer and contains at least one of Ti, Cr, Co, Ni, Mg, Si, V, Ca, Fe, Zn, Zr, Nb, Mo, Rh, Sn, Sb, Te, Ta, W, Ir, Pb, B and C; and the second reflective layer contains at least one of Al, Cu, Ag, Au, Pt and. Pd, and sum of contents of these atoms in the second reflective layer is larger than that of contents of these atoms in the first reflective layer.

Because of this structure, heat generated in the recording layer in the recording mode is selectively and easily transformed to the second reflective layer from the first reflective layer, restraining an inter-mark heat interference occurring at the time of irradiating the laser beam and also enabling the recording layer to cool quickly. Problems such as flowing of the recording film are minimized even after a number of rewrite operations, and a high quality signal can be obtained with a low jitter (see, for example, page 8, lines 15 - 21 and page 21, lines 9 - 21 of the present specification).

A further feature of the invention is that the information recording medium comprises a third protective layer and a fourth protective layer that comprises any one of an oxide, a nitride and a fluoride, and having a thickness of 2 - 8 nm (see, for example,

page 6, line 11 to page 7, line 1 of the present specification). This two-film protective layer can act to prevent the adverse influences caused by the diffusion of the material of the first protective layer into the recording layer (see, for example, page 7, lines 1 - 4 of the present specification).

Objection to Claims 42 and 43

Claims 42 and 43 were objected to as being improper dependent claims. In response, Claims 42 and 43 are canceled.

Rejection of Claims 32, 39, 40 and 42 - 43 under 35 U.S.C. §102(b) or §103(a) over JP 05-342631

Claims 32, 39, 40 and 42 - 43 were rejected under 35 U.S.C. §103(a) as obvious over Yamada (U.S. Patent No. 6,153,063) in view of Hirotsune (U.S. Patent No. 5,958,649). The Examiner alleges that Yamada teaches a substrate, a zinc sulfide/silicon dioxide layer, a GeN or GeNO layer, a phase change GeSbTe recording layer, a second 5 nm GeN or GeNO layer, a second zinc sulfide/silicon dioxide layer, a Ni-Cr reflective layer and a protective layer and that when GeN is used, the thickness is 5 nm. The Examiner further alleges that Hirotsune teaches optical recording media that comprise a substrate, a lower protective layer, a GeSbTe recording layer, an upper protective layer, a first reflective layer and a second reflective layer and that the reference discloses useful compositions for the recording layer and protective layer compositions and that the use of multilayers thereof are disclosed and that grooved substrates are disclosed. The Examiner further alleges that the use of materials and thicknesses that result in a first reflective layer that has an attenuation factor of less than

4 is disclosed, including the use of materials such as Mo, .Ni, Fe, Cr, Ti, W, Ta, Co, Sb, Mg and V and that the thickness of the first layer may be less than 30 nm or less than 15 nm, and that the second reflective layer may contain Al, Cu, Au and alloys thereof with additives Mo, Pd and Pt. The Examiner further alleges that the thickness of the second reflective layer can be between 30 and 200 nm. Regarding claim 31, the Examiner alleges that the figures and embodiment 12 show the use of a polycarbonate substrate, coated with a 125 nm ZnS-SiO_2 film, a 125 nm CrGeSbTe recording film, a 20 nm ZnS-SiO_2 film, a first reflective layer of Mo having a thickness of 15 nm and a second reflective layer of 10 nm of Al and that the text throughout the twelfth embodiment shows the replacement of Mo with other metals and the replacement of Al with various alloys. The Examiner alleges that it would have been obvious to modify the invention of Yamada by using a 5 nm thickness of GeN for the inner protective layers based upon the disclosure to do so and by adding a second reflective layer to increase the reflectivity as taught by Hirotsune.

This rejection is traversed. Yamada only discloses one reflective layer and fails to teach a second reflective layer as required by independent Claim 32. Hirotsune discloses two reflective layers, but Hirotsune, alone or in combination with Yamada, does not teach or suggest the feature of the present invention that the sum of contents of the named atoms in said second reflective layer is larger than that of contents of the named atoms in said first reflective layer. As discussed above, this feature allows for the heat generated in the recording layer in the recording mode to be selectively and easily transformed to the second reflective layer from the first reflective layer, restraining an inter-mark heat interference occurring at the time of irradiating the laser beam and also enabling the recording layer to cool quickly. Problems such as flowing of the recording

film are minimized even after a number of rewrite operations, and a high quality signal can be obtained with a low jitter. (See, for example, page 8, lines 15 - 21 and page 21, lines 9 - 21 of the present specification).

Accordingly, it is respectfully submitted that Claims 31, 39 and 40 (Claims 42 and 43 having been canceled) would not have been obvious over Yamada and Hirotsune, alone or in combination.

Rejection of Claims 32, 39, 40 and 42 - 43 under 35 U.S.C. §103(a) over Yoshio in view of Hirotsune

Claims 32, 39, 40 and 42 - 43 were rejected under 35 U.S.C. §103(a) as obvious over Yoshio JP 05-217211 in view of Hirotsune. The Examiner alleges that Yoshio JP 05-217211 teaches a substrate, a zinc sulfide/silicon dioxide layer, a 10 nm silicon nitride layer, a phase change GeSbTe recording layer, a second 10nm silicon nitride layer, a second zinc sulfide/silicon dioxide layer, and an Al -Ti reflective layer and that the use of other materials, such as nitrides and carbides for the inner protective layers and thicknesses of 5-50nm is disclosed. The Examiner alleges that it would have been obvious to modify the invention of Yoshio JP 05-217211 by using other thicknesses such as 5-8 nm for the inner protective layers, rather than the 10 nm used in the examples based upon the disclosed equivalence and by adding a second reflective layer to increase the reflectivity as taught by Hirotsune '649.

This rejection is traversed. Yoshio only discloses one reflective layer and fails to teach a second reflective layer as required by independent Claim 32. Hirotsune discloses two reflective layers, but Hirotsune, alone or in combination with Yoshio, does not teach or suggest the feature of the present invention that the sum of contents of the

named atoms in said second reflective layer is larger than that of contents of the named atoms in said first reflective layer. As discussed above, this feature allows for the heat generated in the recording layer in the recording mode to be selectively and easily transformed to the second reflective layer from the first reflective layer, restraining an inter-mark heat interference occurring at the time of irradiating the laser beam and also enabling the recording layer to cool quickly. Problems such as flowing of the recording film are minimized even after a number of rewrite operations, and a high quality signal can be obtained with a low jitter. (see, for example, page 8, lines 15 - 21 and page 21, lines 9 - 21 of the present specification).

Accordingly, it is respectfully submitted that Claims 31, 39 and 40 (Claims 42 and 43 having been canceled) would not have been obvious over Yoshio and Hirotsune, alone or in combination.

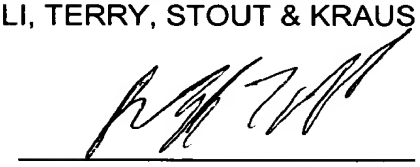
Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that Claims 32, 39 and 40 are in condition for allowance. Favorable reconsideration is respectfully requested.

Should the Examiner believe that anything further is necessary to place this application in condition for allowance, the Examiner is requested to contact applicants' undersigned attorney at the telephone number listed below.

Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 01-2135 (500.35843CC2).

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS



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